

**Measurement of Soil Gas to Indoor Air
Attenuation Rates Using Radon As
A Naturally-Occurring Tracer Gas**

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Discussion/Results/Evaluation: The quantification of exposure risks associated with soil gas intrusion to indoor air is becoming increasingly important as properties impacted with volatile organic compounds (VOCs) are routinely being redeveloped. The migration of soil gas containing VOCs to indoor air can result in significant carcinogenic/toxicological exposure risks. VOCs are almost universally present in the interior air of all buildings. The authors found that the concurrent measurement of the concentrations of naturally-occurring radon in the soil gas beneath buildings, and in the interior air of buildings, can provide a reliable basis for calculating building-specific soil gas to indoor air attenuation rates. They concurrently measured radon gas levels in the soil gas, the indoor air, and the outdoor air at several hundred buildings to date. Measurements are made in real-time with a high level of resolution.

Conclusions / Implications: The recorded measurements provide a means of determining building-specific soil gas to indoor air attenuation rates. If significant soil gas intrusion is detected, monitoring equipment can be utilized to identify the entry point(s). The monitoring of radon gas indoor-air detectors can be used to screen for soil gas intrusion. That data can be used to monitor the long-term performance of soil vapor mitigation systems.